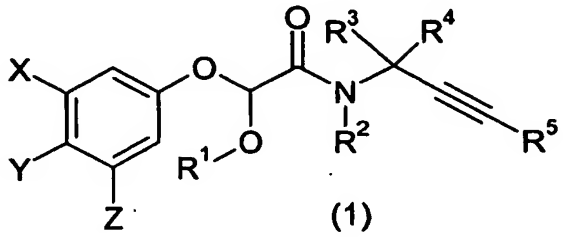
CLAIMS

1. The use as a plant fungicide of a compound of the general formula (1):



(1)

wherein

X, Y and Z are independently H, halogen, C_{1-4} alkyl, halo(C_{1-4})alkyl, C_{2-4} alkenyl, halo(C_{2-4})alkenyl, C_{2-4} alkynyl, halo(C_{2-4})alkynyl, C_{1-4} alkoxy, halo(C_{1-4})alkoxy, -$S(O)_n$(C_{1-4})alkyl where n is 0, 1 or 2 and the alkyl group is optionally substituted with fluoro, -OSO_2(C_{1-4})alkyl where the alkyl group is optionally substituted with fluoro, cyano, nitro, C_{1-4} alkoxycarbonyl, -CONR'R", -COR', -NR'COR" or -NR'COOR'" where R' and R" are independently H or C_{1-4} alkyl and R'" is C_{1-4} alkyl, provided that at least one of X and Z is other than H;

R^1 is a straight-chain C_{1-4} alkyl group;

R^2 is H, C_{1-4} alkyl, C_{1-4} alkoxymethyl or benzyloxymethyl in which the phenyl ring of the benzyl moiety is optionally substituted with C_{1-4} alkoxy;

R^3 and R^4 are independently H, C_{1-3} alkyl, C_{2-3} alkenyl or C_{2-3} alkynyl provided that both are not H and that when both are other than H their combined total of carbon atoms does not exceed 4, or

R^3 and R^4 join with the carbon atom to which they are attached to form a 3 or 4 membered carbocyclic ring optionally containing one O, S or N atom and optionally substituted with halo or C_{1-4} alkyl; and

R^5 is H, C_{1-4} alkyl or C_{3-6} cycloalkyl in which the alkyl or cycloalkyl group is optionally substituted with halo, hydroxy, C_{1-6} alkoxy, cyano, C_{1-4} alkylcarbonyl-oxy, aminocarbonyloxy, mono- or di(C_{1-4})alkylaminocarbonyloxy, -$S(O)_n$(C_{1-6})-alkyl where n is 0, 1 or 2, triazolyl, tri(C_{1-4})-alkylsilyloxy, optionally substituted phenoxy, optionally substituted thienyloxy, optionally substituted benzyloxy or optionally substituted thienylmethoxy, or

R^5 is optionally substituted phenyl, optionally substituted thienyl or optionally

substituted benzyl,

in which the optionally substituted phenyl and thienyl rings of the R^5 values are optionally substituted with one, two or three substituents selected from halo, hydroxy, mercapto, C_{1-4} alkyl, C_{2-4} alkenyl, C_{2-4} alkynyl, C_{1-4} alkoxy, C_{2-4} alkenyloxy, C_{2-4} alkynyloxy, halo(C_{1-4})alkyl, halo(C_{1-4})alkoxy, C_{1-4} alkylthio, halo(C_{1-4})alkylthio, hydroxy(C_{1-4})alkyl, C_{1-4} alkoxy(C_{1-4})alkyl, C_{3-6} cycloalkyl, C_{3-6} cycloalkyl(C_{1-4})alkyl, phenoxy, benzyloxy, benzoyloxy, cyano, isocyano, thiocyanato, isothiocyanato, nitro, $-NR^mR^n$, $-NHCOR^m$, $-NHCONR^mR^n$, $-CONR^mR^n$, $-SO_2R^m$, $-OSO_2R^m$, $-COR^m$, $-CR^m{=}NR^n$ or $-N{=}CR^mR^n$, in which R^m and R^n are independently hydrogen, C_{1-4} alkyl, halo(C_{1-4})alkyl, C_{1-4} alkoxy, halo-(C_{1-4})alkoxy, C_{1-4} alkylthio, C_{3-6} cycloalkyl, C_{3-6} cycloalkyl(C_{1-4})alkyl, phenyl or benzyl, the phenyl and benzyl groups being optionally substituted with halogen, C_{1-4} alkyl or C_{1-4} alkoxy.

2. The use as a plant fungicide of a compound of the general formula (1) according to claim 1 wherein X, Y and Z are all chloro or methyl, or X and Z are both chloro or bromo and Y is H or methyl, or X and Z are both methyl or methoxy and Y is H, chloro, bromo or alkylthio, or X is methoxy, Y is H and Z is cyano or chloro, or X is methyl, Y is H and Z is ethyl, or X is chloro, bromo or trifluoromethyl and both Y and Z are H.

3. The use as a plant fungicide of a compound of the general formula (1) according to claim 1 or 2 wherein R^1 is methyl, ethyl, *n*-propyl, or *n*-butyl.

4. The use as a plant fungicide of a compound of the general formula (1) according to claim 1 or 2 wherein R^1 is methyl or ethyl.

5. The use as a plant fungicide of a compound of the general formula (1) according to any one of the preceding claims wherein R^2 is H.

6. The use as a plant fungicide of a compound of the general formula (1) according to any one of the preceding claims wherein both R^3 and R^4 are methyl.

7. The use as a plant fungicide of a compound of the general formula (1) according to any one of the preceding claims wherein R^5 is H, methyl, hydroxymethyl, methoxymethyl, 1-methoxyethyl, *tert*-butyldimethylsilyloxymethyl, 3-cyanopropyl, 3-(1,2,4-triazol-1-yl)propyl, 3-methylthiopropyl, 3-methanesulphinylpropyl or 3-methanesulphonylpropyl.

8. The use as a plant fungicide of a compound of the general formula (1) according to claim 1 wherein

X, Y and Z are independently H, halogen, C_{1-4} alkyl, halo(C_{1-4})alkyl, C_{2-4} alkenyl, halo(C_{2-4})alkenyl, C_{2-4} alkynyl, halo(C_{2-4})alkynyl, C_{1-4} alkoxy, halo(C_{1-4})alkoxy, -$S(O)_n$(C_{1-4})alkyl where n is 0, 1 or 2 and the alkyl group is optionally substituted with fluoro, -OSO_2(C_{1-4})alkyl where the alkyl group is optionally substituted with fluoro, cyano, nitro, C_{1-4} alkoxycarbonyl, -CONR'R", -COR' or -NR'COR" where R' and R" are independently H or C_{1-4} alkyl, provided that at least one of X and Z is other than H;

R^1 is a straight-chain C_{1-4} alkyl group;

R^2 is H, C_{1-4} alkyl, C_{1-4} alkoxymethyl or benzyloxymethyl in which the phenyl ring of the benzyl moiety is optionally substituted with C_{1-4} alkoxy;

R^3 and R^4 are independently H, C_{1-3} alkyl, C_{2-3} alkenyl or C_{2-3} alkynyl provided that both are not H and that when both are other than H their combined total of carbon atoms does not exceed 4, or

R^3 and R^4 join with the carbon atom to which they are attached to form a 3 or 4 membered carbocyclic ring optionally containing one O, S or N atom and optionally substituted with halo or C_{1-4} alkyl; and

R^5 is H, C_{1-4} alkyl or C_{3-6} cycloalkyl in which the alkyl or cycloalkyl group is optionally substituted with halo, hydroxy, C_{1-6} alkoxy, C_{1-6} alkylthio, cyano, C_{1-4} alkylcarbonyloxy, aminocarbonyloxy or mono- or di(C_{1-4})alkylaminocarbonyloxy, tri(C_{1-4})-alkylsilyloxy, optionally substituted phenoxy, optionally substituted thienyloxy, optionally substituted benzyloxy or optionally substituted thienylmethoxy, or

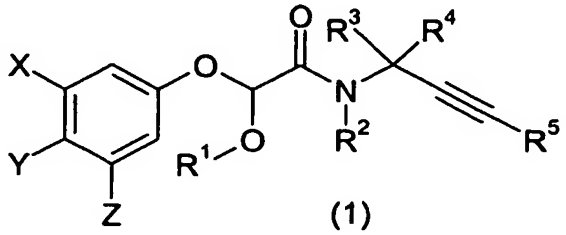
R^5 is optionally substituted phenyl, optionally substituted thienyl or optionally

substituted benzyl,

in which the optionally substituted phenyl and thienyl rings of the R^5 values are optionally substituted with one, two or three substituents selected from halo, hydroxy, mercapto, C_{1-4} alkyl, C_{2-4} alkenyl, C_{2-4} alkynyl, C_{1-4} alkoxy, C_{2-4} alkenyloxy, C_{2-4} alkynyloxy, halo(C_{1-4})alkyl, halo(C_{1-4})alkoxy, C_{1-4} alkylthio, halo(C_{1-4})alkylthio, hydroxy(C_{1-4})alkyl, C_{1-4} alkoxy(C_{1-4})alkyl, C_{3-6} cycloalkyl, C_{3-6} cycloalkyl(C_{1-4})alkyl, phenoxy, benzyloxy, benzoyloxy, cyano, isocyano, thiocyanato, isothiocyanato, nitro, $-NR^mR^n$, $-NHCOR^m$, $-NHCONR^mR^n$, $-CONR^mR^n$, $-SO_2R^m$, $-OSO_2R^m$, $-COR^m$, $-CR^m{=}NR^n$ or $-N{=}CR^mR^n$, in which R^m and R^n are independently hydrogen, C_{1-4} alkyl, halo(C_{1-4})alkyl, C_{1-4} alkoxy, halo-(C_{1-4})alkoxy, C_{1-4} alkylthio, C_{3-6} cycloalkyl, C_{3-6} cycloalkyl(C_{1-4})alkyl, phenyl or benzyl, the phenyl and benzyl groups being optionally substituted with halogen, C_{1-4} alkyl or C_{1-4} alkoxy.

9. The use as a plant fungicide of a compound of the general formula (1) according to claim 1 wherein X, Y and Z are all chloro or methyl, or X and Z are both chloro or bromo and Y is H or methyl, or X and Z are both methyl or methoxy and Y is H, chloro, bromo or alkylthio, or X is methoxy, Y is H and Z is cyano or chloro, or X is methyl, Y is H and Z is ethyl, or X is chloro, bromo or trifluoromethyl and both Y and Z are H; R^1 is methyl, ethyl, *n*-propyl or *n*-butyl; R^2 is H; R^3 and R^4 are both methyl; and R^5 is H, methyl, hydroxymethyl, methoxymethyl, 1-methoxyethyl, *tert*-butyldimethylsilyloxymethyl, 3-cyanopropyl, 3-(1,2,4-triazol-1-yl)propyl, 3-methylthiopropyl, 3-methanesulphinylpropyl or 3-methanesulphonylpropyl.

10. A compound of the general formula (1):



(1)

wherein

X, Y and Z are independently H, halogen, C_{1-4} alkyl, halo(C_{1-4})alkyl, C_{2-4} alkenyl, halo(C_{2-4})alkenyl, C_{2-4} alkynyl, halo(C_{2-4})alkynyl, C_{1-4} alkoxy, halo(C_{1-4})alkoxy, -$S(O)_n$(C_{1-4})alkyl where n is 0, 1 or 2 and the alkyl group is optionally substituted with fluoro, -OSO_2(C_{1-4})alkyl where the alkyl group is optionally substituted with fluoro, cyano, nitro, C_{1-4} alkoxycarbonyl, -CONR'R", -COR', -NR'COR" or -NR'COOR'" where R' and R" are independently H or C_{1-4} alkyl and R'" is C_{1-4} alkyl, provided that at least one of X and Z is other than H;

R^1 is a straight-chain C_{1-4} alkyl group;

R^2 is H, C_{1-4} alkyl, C_{1-4} alkoxymethyl or benzyloxymethyl in which the phenyl ring of the benzyl moiety is optionally substituted with C_{1-4} alkoxy;

R^3 and R^4 are independently H, C_{1-3} alkyl, C_{2-3} alkenyl or C_{2-3} alkynyl provided that both are not H and that when both are other than H their combined total of carbon atoms does not exceed 4, or

R^3 and R^4 join with the carbon atom to which they are attached to form a 3 or 4 membered carbocyclic ring optionally containing one O, S or N atom and optionally substituted with halo or C_{1-4} alkyl; and

R^5 is H, C_{1-4} alkyl or C_{3-6} cycloalkyl in which the alkyl or cycloalkyl group is optionally substituted with halo, hydroxy, C_{1-6} alkoxy, cyano, C_{1-4} alkylcarbonyl-oxy, aminocarbonyloxy, mono- or di(C_{1-4})alkylaminocarbonyloxy, -$S(O)_n$(C_{1-6})-alkyl where n is 0, 1 or 2, triazolyl, tri(C_{1-4})-alkylsilyloxy, optionally substituted phenoxy, optionally substituted thienyloxy, optionally substituted benzyloxy or optionally substituted thienylmethoxy, or

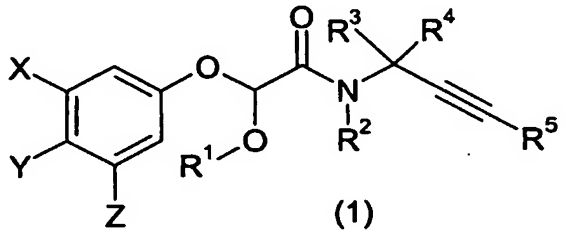
R^5 is optionally substituted phenyl, optionally substituted thienyl or optionally substituted benzyl,

in which the optionally substituted phenyl and thienyl rings of the R^5 values are optionally substituted with one, two or three substituents selected from halo, hydroxy, mercapto, C_{1-4} alkyl, C_{2-4} alkenyl, C_{2-4} alkynyl, C_{1-4} alkoxy, C_{2-4} alkenyl-oxy, C_{2-4} alkynyloxy, halo(C_{1-4})alkyl, halo(C_{1-4})alkoxy, C_{1-4} alkylthio, halo(C_{1-4})-alkylthio, hydroxy(C_{1-4})alkyl, C_{1-4} alkoxy(C_{1-4})alkyl, C_{3-6} cycloalkyl, C_{3-6} cyclo-alkyl(C_{1-4})alkyl, phenoxy, benzyloxy, benzoyloxy, cyano, isocyano, thiocyanato, isothiocyanato, nitro, -NR^mR^n, -$NHCOR^m$, -$NHCONR^mR^n$, -$CONR^mR^n$, -SO_2R^m, -OSO_2R^m, -COR^m, -CR^m=NR^n or -N=CR^mR^n, in which R^m and R^n are

independently hydrogen, C_{1-4} alkyl, halo(C_{1-4})alkyl, C_{1-4} alkoxy, halo(C_{1-4})alkoxy, C_{1-4} alkylthio, C_{3-6} cycloalkyl, C_{3-6} cycloalkyl(C_{1-4})alkyl, phenyl or benzyl, the phenyl and benzyl groups being optionally substituted with halogen, C_{1-4} alkyl or C_{1-4} alkoxy;

provided that R^5 is not H when (i) X, Z, R^1, R^3 and R^4 are all methyl and Y, and R^2 are both H, (ii) X, Z, R^3 and R^4 are all methyl, Y is chloro, R^1 is ethyl and R^2 is H, (iii) X and Z are both chloro, R^1 is methyl or ethyl, R^3 and R^4 are both methyl and Y and R^2 are both H, (iv) X, Y and Z are all chloro, R^1, R^3 and R^4 are all methyl and R^2 is H, and (v) Y is chloro, Z is trifluoromethyl, R^1, R^3 and R^4 are all methyl and X and R^2 are both H.

11. A compound of the general formula (1):



(1)

wherein

X, Y and Z are independently H, fluoro, bromo, iodo, C_{2-4} alkyl, halo(C_{1-4})alkyl, C_{2-4} alkenyl, halo(C_{2-4})alkenyl, C_{2-4} alkynyl, halo(C_{2-4})alkynyl, C_{1-4} alkoxy, halo-(C_{1-4})alkoxy, -$S(O)_n$(C_{1-4})alkyl where n is 0, 1 or 2 and the alkyl group is optionally substituted with fluoro, -OSO_2(C_{1-4})alkyl where the alkyl group is optionally substituted with fluoro, cyano, nitro, C_{1-4} alkoxycarbonyl, -CONR'R", -COR', -NR'COR" or -NR'COOR'" where R' and R" are independently H or C_{1-4} alkyl and R'" is C_{1-4} alkyl, provided that at least one of X and Z is other than H;

R^1 is a straight-chain C_{1-4} alkyl group;

R^2 is H, C_{1-4} alkyl, C_{1-4} alkoxymethyl or benzyloxymethyl in which the phenyl ring of the benzyl moiety is optionally substituted with C_{1-4} alkoxy;

R^3 and R^4 are independently H, C_{1-3} alkyl, C_{2-3} alkenyl or C_{2-3} alkynyl provided that both are not H and that when both are other than H their combined total of carbon atoms does not exceed 4, or

R^3 and R^4 join with the carbon atom to which they are attached to form a 3 or 4

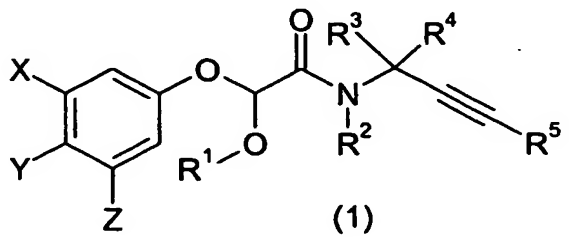
membered carbocyclic ring optionally containing one O, S or N atom and optionally substituted with halo or C_{1-4} alkyl; and

R^5 is H, C_{1-4} alkyl or C_{3-6} cycloalkyl in which the alkyl or cycloalkyl group is optionally substituted with halo, hydroxy, C_{1-6} alkoxy, cyano, C_{1-4} alkylcarbonyloxy, aminocarbonyloxy, mono- or di(C_{1-4})alkylaminocarbonyloxy, -S(O)$_n$(C_{1-6})-alkyl where n is 0, 1 or 2, triazolyl (e.g. 1,2,4-triazol-1-yl), tri(C_{1-4})-alkylsilyloxy, optionally substituted phenoxy, optionally substituted thienyloxy, optionally substituted benzyloxy or optionally substituted thienylmethoxy, or

R^5 is optionally substituted phenyl, optionally substituted thienyl or optionally substituted benzyl,

in which the optionally substituted phenyl and thienyl rings of the R^5 values are optionally substituted with one, two or three substituents selected from halo, hydroxy, mercapto, C_{1-4} alkyl, C_{2-4} alkenyl, C_{2-4} alkynyl, C_{1-4} alkoxy, C_{2-4} alkenyloxy, C_{2-4} alkynyloxy, halo(C_{1-4})alkyl, halo(C_{1-4})alkoxy, C_{1-4} alkylthio, halo(C_{1-4})-alkylthio, hydroxy(C_{1-4})alkyl, C_{1-4} alkoxy(C_{1-4})alkyl, C_{3-6} cycloalkyl, C_{3-6} cycloalkyl(C_{1-4})alkyl, phenoxy, benzyloxy, benzoyloxy, cyano, isocyano, thiocyanato, isothiocyanato, nitro, -NR^mR^n, -$NHCOR^m$, -$NHCONR^mR^n$, -$CONR^mR^n$, -SO_2R^m, -OSO_2R^m, -COR^m, -CR^m=NR^n or -N=CR^mR^n, in which R^m and R^n are independently hydrogen, C_{1-4} alkyl, halo(C_{1-4})alkyl, C_{1-4} alkoxy, halo(C_{1-4})alkoxy, C_{1-4} alkylthio, C_{3-6} cycloalkyl, C_{3-6} cycloalkyl(C_{1-4})alkyl, phenyl or benzyl, the phenyl and benzyl groups being optionally substituted with halogen, C_{1-4} alkyl or C_{1-4} alkoxy.

12. A compound of the general formula (1):



(1)

wherein

X, Y and Z are independently H, halogen, C_{1-4} alkyl, halo(C_{1-4})alkyl, C_{2-4} alkenyl, halo(C_{2-4})alkenyl, C_{2-4} alkynyl, halo(C_{2-4})alkynyl, C_{1-4} alkoxy, halo(C_{1-4})alkoxy,

-$S(O)_n(C_{1-4})$alkyl where n is 0, 1 or 2 and the alkyl group is optionally substituted with fluoro, -$OSO_2(C_{1-4})$alkyl where the alkyl group is optionally substituted with fluoro, cyano, nitro, C_{1-4} alkoxycarbonyl, -CONR'R", -COR', -NR'COR" or -NR'COOR'" where R' and R" are independently H or C_{1-4} alkyl and R'" is C_{1-4} alkyl, provided that at least one of X and Z is other than H;

R^1 is a straight-chain C_{1-4} alkyl group;

R^2 is H, C_{1-4} alkyl, C_{1-4} alkoxymethyl or benzyloxymethyl in which the phenyl ring of the benzyl moiety is optionally substituted with C_{1-4} alkoxy;

R^3 and R^4 are independently H, C_{1-3} alkyl, C_{2-3} alkenyl or C_{2-3} alkynyl provided that both are not H and that when both are other than H their combined total of carbon atoms does not exceed 4, or

R^3 and R^4 join with the carbon atom to which they are attached to form a 3 or 4 membered carbocyclic ring optionally containing one O, S or N atom and optionally substituted with halo or C_{1-4} alkyl; and

R^5 is C_{1-4} alkyl or C_{3-6} cycloalkyl in which the alkyl or cycloalkyl group is optionally substituted with halo, hydroxy, C_{1-6} alkoxy, cyano, C_{1-4} alkylcarbonyl-oxy, aminocarbonyloxy, mono- or di(C_{1-4})alkylaminocarbonyloxy, -$S(O)_n(C_{1-6})$-alkyl where n is 0, 1 or 2, triazolyl (e.g. 1,2,4-triazol-1-yl), tri(C_{1-4})-alkylsilyloxy, optionally substituted phenoxy, optionally substituted thienyloxy, optionally substituted benzyloxy or optionally substituted thienylmethoxy, or

R^5 is optionally substituted phenyl, optionally substituted thienyl or optionally substituted benzyl,

in which the optionally substituted phenyl and thienyl rings of the R^5 values are optionally substituted with one, two or three substituents selected from halo, hydroxy, mercapto, C_{1-4} alkyl, C_{2-4} alkenyl, C_{2-4} alkynyl, C_{1-4} alkoxy, C_{2-4} alkenyl-oxy, C_{2-4} alkynyloxy, halo(C_{1_4})alkyl, halo(C_{1-4})alkoxy, C_{1-4} alkylthio, halo(C_{1-4})-alkylthio, hydroxy(C_{1-4})alkyl, C_{1-4} alkoxy(C_{1-4})alkyl, C_{3-6} cycloalkyl, C_{3-6} cyclo-alkyl(C_{1-4})alkyl, phenoxy, benzyloxy, benzoyloxy, cyano, isocyano, thiocyanato, isothiocyanato, nitro, -NR^mR^n, -$NHCOR^m$, -$NHCONR^mR^n$, -$CONR^mR^n$, -SO_2R^m, -OSO_2R^m, -COR^m, -$CR^m{=}NR^n$ or -$N{=}CR^mR^n$, in which R^m and R^n are independently hydrogen, C_{1-4} alkyl, halo(C_{1-4})alkyl, C_{1-4} alkoxy, halo(C_{1-4})alkoxy, C_{1-4} alkylthio, C_{3-6} cycloalkyl, C_{3-6} cycloalkyl(C_{1-4})alkyl, phenyl or benzyl, the

phenyl and benzyl groups being optionally substituted with halogen, C_{1-4} alkyl or C_{1-4} alkoxy.

13. A compound according to claim 10 or 12 wherein X, Y and Z are all chloro or methyl, or X and Z are both chloro or bromo and Y is H or methyl, or X and Z are both methyl or methoxy and Y is H, chloro, bromo or alkylthio, or X is methoxy, Y is H and Z is cyano or chloro, or X is methyl, Y is H and Z is ethyl, or X is chloro, bromo or trifluoromethyl and both Y and Z are H; R^1 is methyl, ethyl, *n*-propyl or *n*-butyl; R^2 is H; R^3 and R^4 are both methyl; and R^5 is methyl, hydroxymethyl, methoxymethyl, 1-methoxyethyl, *tert*-butyldimethylsilyloxy-methyl, 3-cyanopropyl, 3-(1,2,4-triazol-1-yl)propyl, 3-methylthiopropyl, 3-methanesulphinylpropyl or 3-methanesulphonylpropyl.

14. A process for preparing a compound of the general formula (1) as defined in claim 1 as herein described.

15. A fungicidal composition comprising a fungicidally effective amount of a compound of the general formula (1) as defined in claim 1 and a suitable carrier or diluent therefor.

16. A method of combating or controlling phytopathogenic fungi which comprises applying a fungicidally effective amount of a compound of the general formula (1) as defined in claim 1 or a composition according to claim 15 to a plant, to a seed of a plant, to the locus of the plant or seed or to soil or any other plant growth medium.